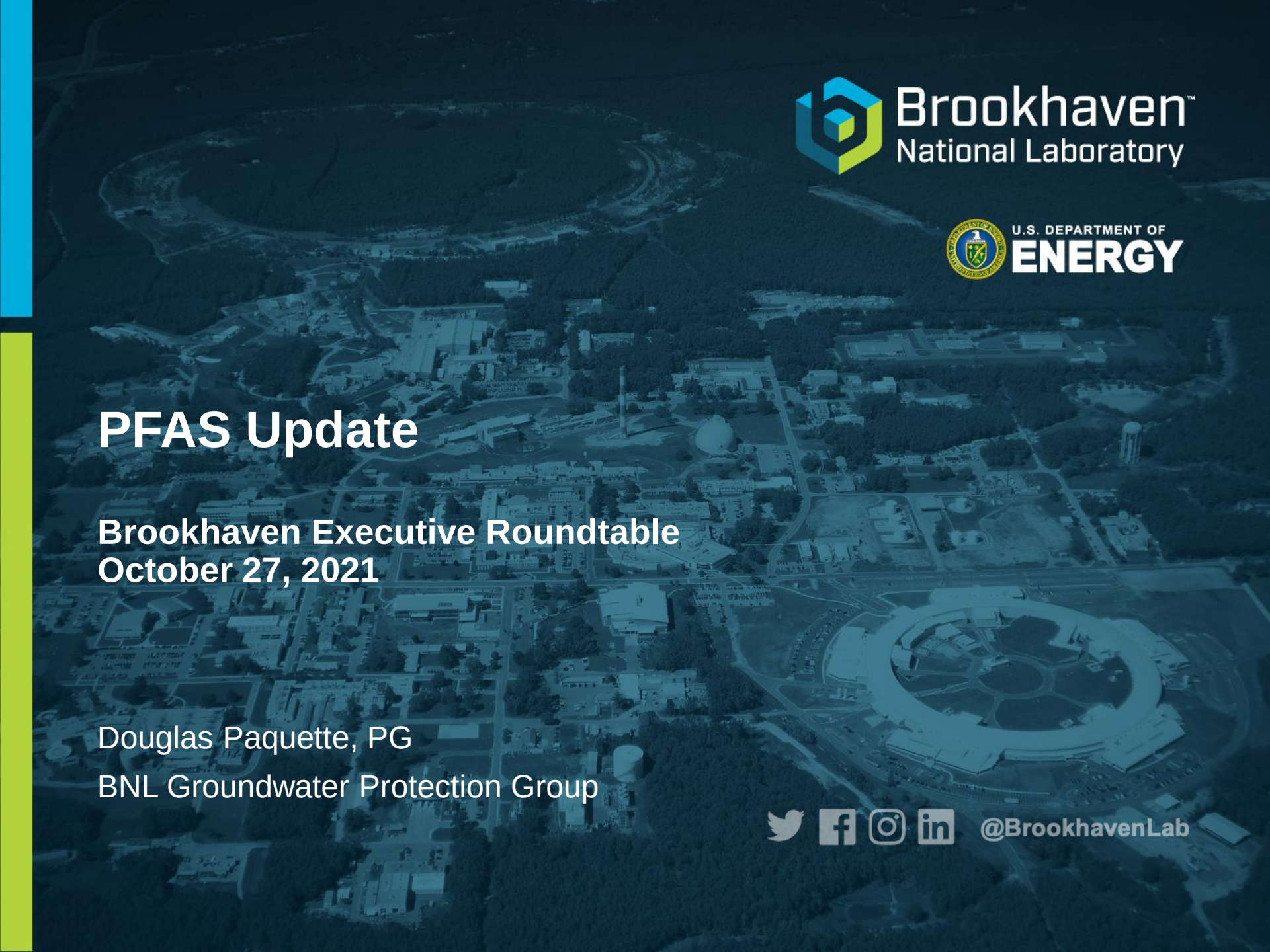


PFAS Update

Brookhaven Executive Roundtable
October 27, 2021

Douglas Paquette, PG

BNL Groundwater Protection Group

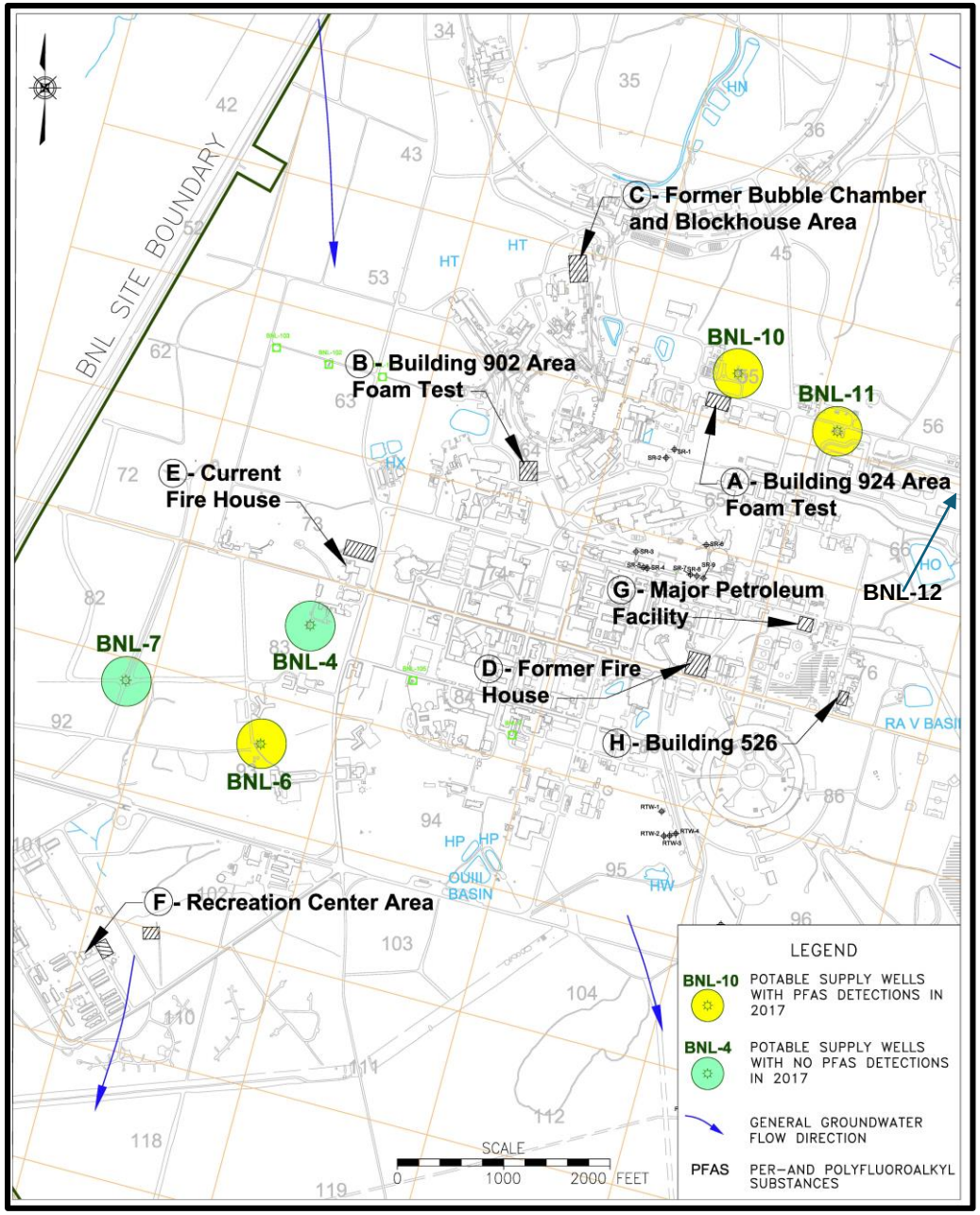
@BrookhavenLab

Agenda

- Update on PFAS treatment systems for BNL potable water supply wells
- Integration of PFAS and 1,4-dioxane remedial actions into the ongoing CERCLA program
- Installation of two PFAS groundwater treatment systems
- Continued characterization of the current firehouse PFAS plume

BNL Water Supply Wells

- Return to service granular activated carbon filters to remove PFOS and PFOA
  - Filters at BNL-10 and BNL-11 are back in service
    - Monitoring results show that the filters are effective
    - The temporary “deferral” from the PFOS MCL received in October 2020 for supply well BNL-10 was closed out by NYSDOH on October 1, 2021
  - BNL-12 expected to be back in service by January 2022
    - With carbon filters
  - Treatment is not required for BNL-7
  - BNL-4 and BNL-6 will remain out of service due to PFAS
    - SCDHS is aware of their status
    - Routine monitoring will be discontinued



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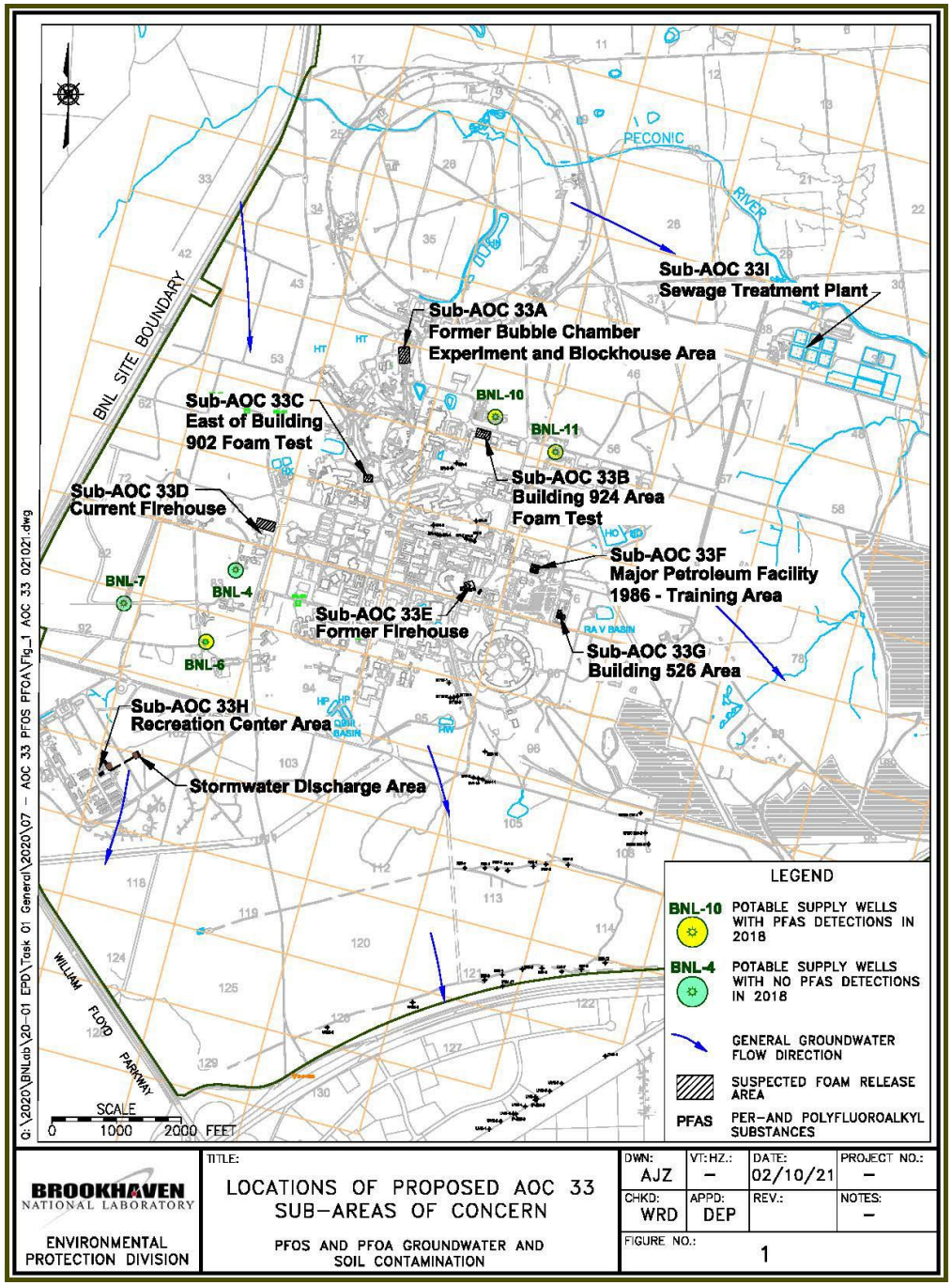
Integrate Response to PFAS and 1,4-Dioxane into CERCLA Program

- Under the Federal Facilities Agreement, DOE is under a continuing obligation to notify EPA and NYSDEC of any additional potential Areas of Concern which DOE becomes aware
- EPA and NYSDEC agreed to recent BNL/DOE recommendation to integrate future investigations and remedial responses into the CERCLA program
  - Planned remediation of the current firehouse and former firehouse PFAS plumes as a Time Critical Removal Action (TCRA)
  - Full Remedial Investigation/Feasibility Study (RI/FS) will be required

Integration of PFAS and 1,4-Dioxane into CERCLA Program

- Established Operable Unit (OU VIII) that covers PFOS, PFOA and 1,4-dioxane remedial investigation and remedial actions
- Established new Areas of Concern 33 and 34
  - AOC 33: PFOS and PFOA with 9 sub-areas (33a through 33i)
  - AOC 34: 1,4-Dioxane



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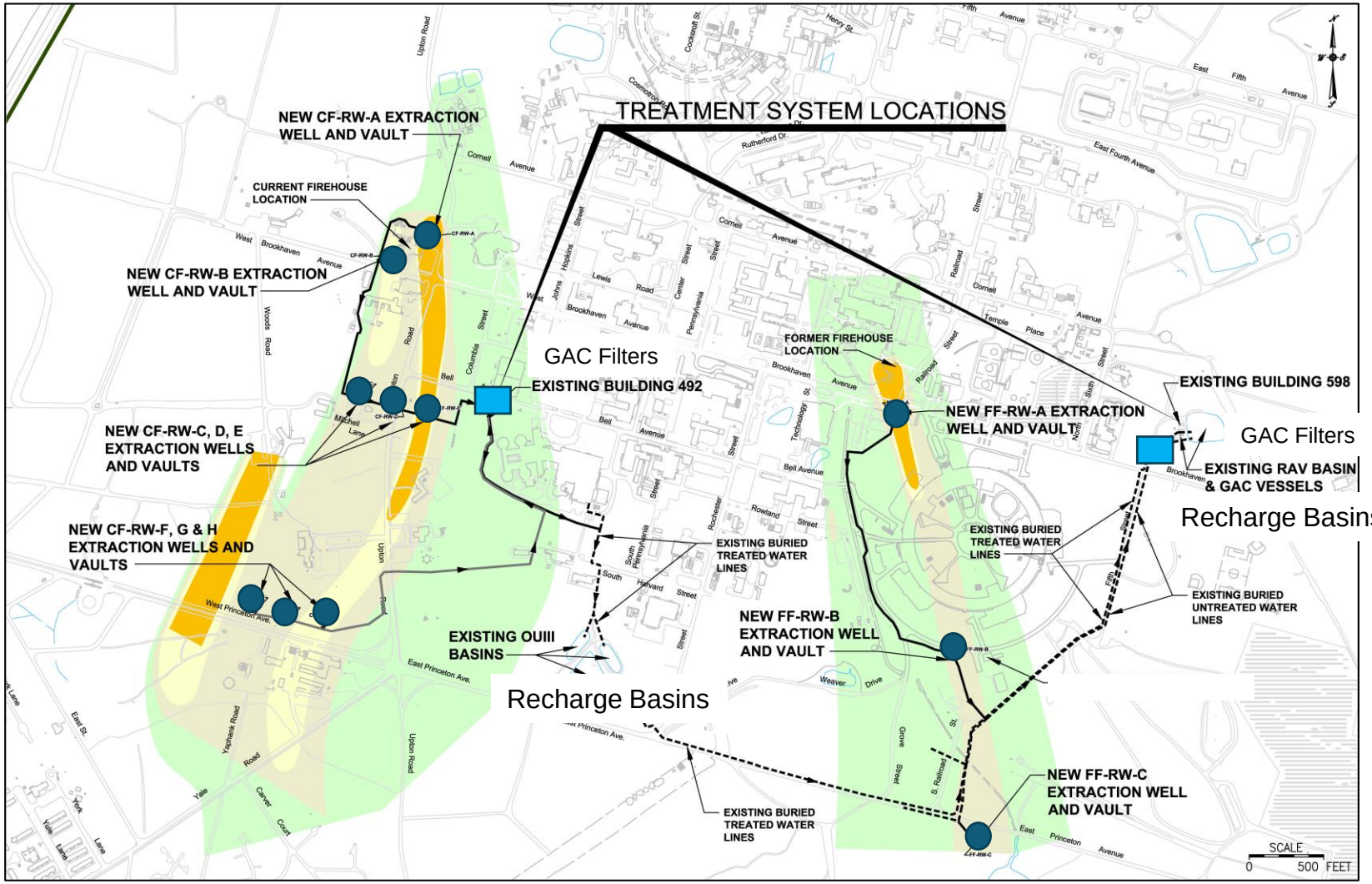
Time Critical Removal Action (TCRA)

PFAS Treatment Systems



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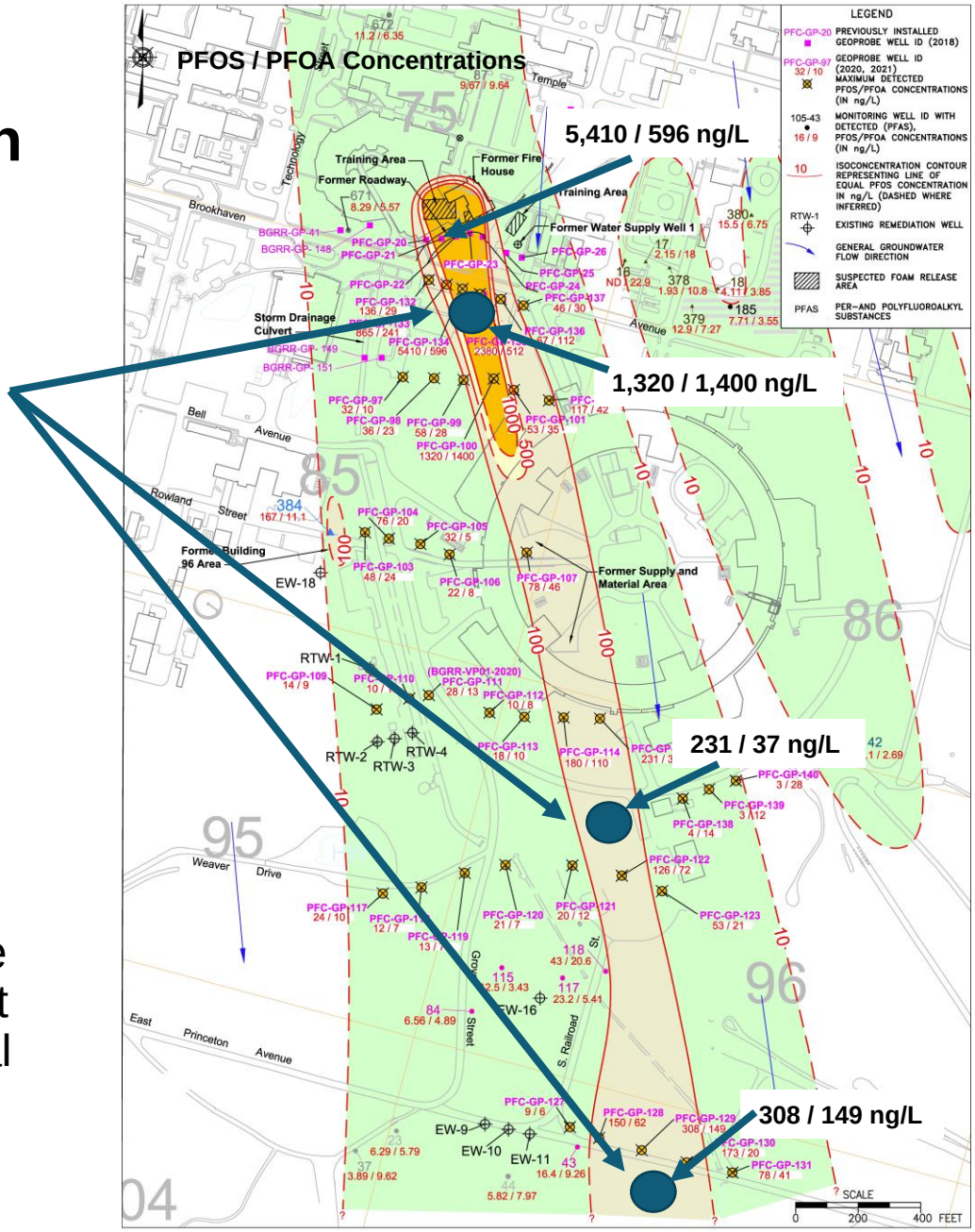
Former Firehouse Plume Treatment System Design

- Treatment system design
  - Three extraction wells
  - Capture goal of 100 ng/L for PFOS or PFOA
  - Carbon filters used for the former HFBR treatment system (for VOCs) will be placed back into service, and a new building constructed around them
- Monitoring
  - Install 29 groundwater monitoring wells
  - Data will be used to verify the effectiveness of the treatment system and monitored natural attenuation



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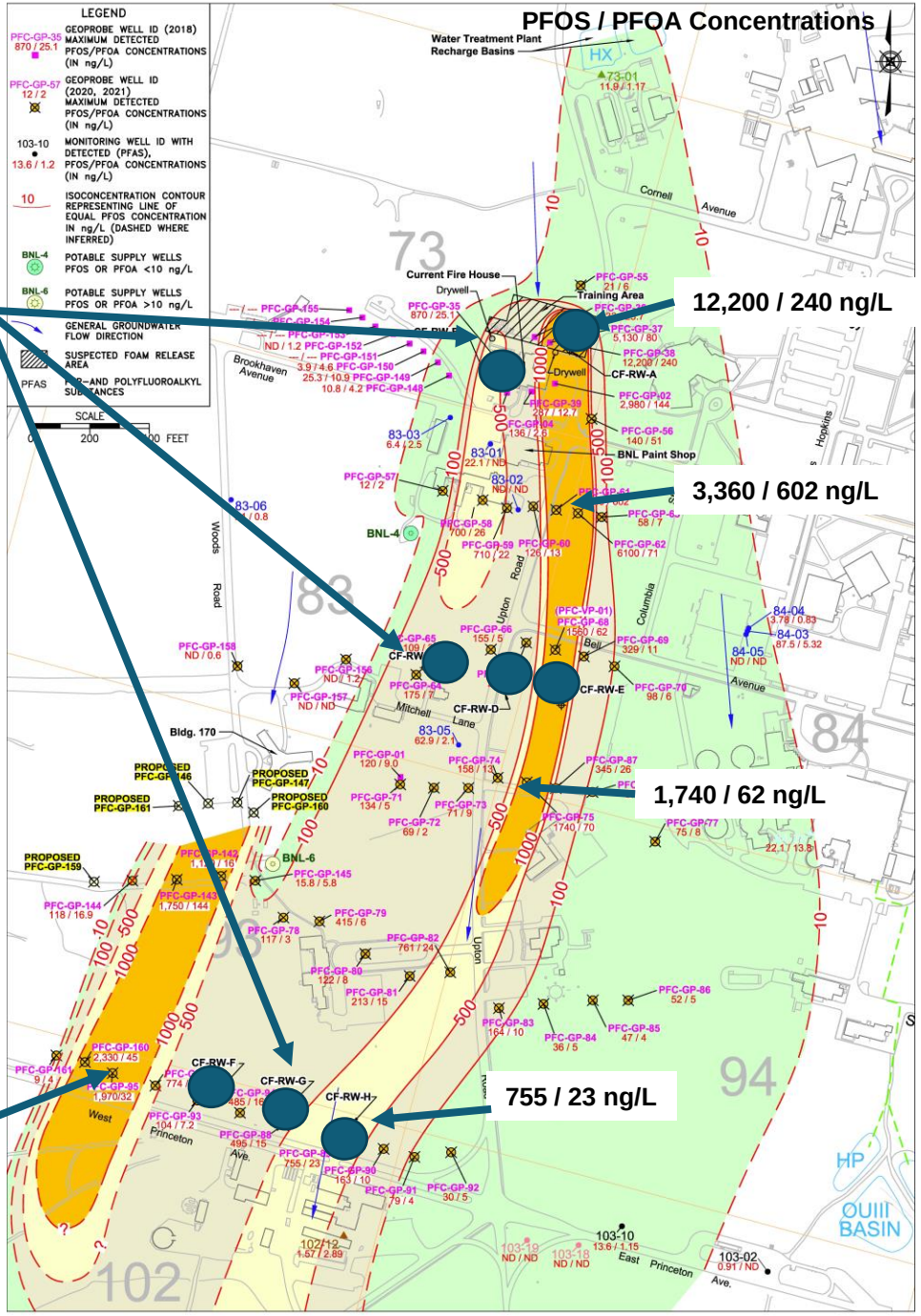
Current Firehouse Plume

- Treatment system design
  - Currently eight extraction wells
  - Capture goal of 100 ng/L for PFOS or PFOA
  - New carbon filters installed in repurposed treatment building
- Monitoring
  - Install 54 groundwater monitoring wells
  - Data will be used to verify the effectiveness of the treatment system and monitored natural attenuation

April-July, installed eight additional wells. Detected PFOS up to 2,330 ng/L

Conducting engineering/cost evaluation for adding an additional extraction well to the system



Installation of temporary monitoring wells

Collected samples from multiple depths at each location to determine vertical distribution of PFAS in the aquifer. Typically, at 10 feet intervals to depths of 150 feet

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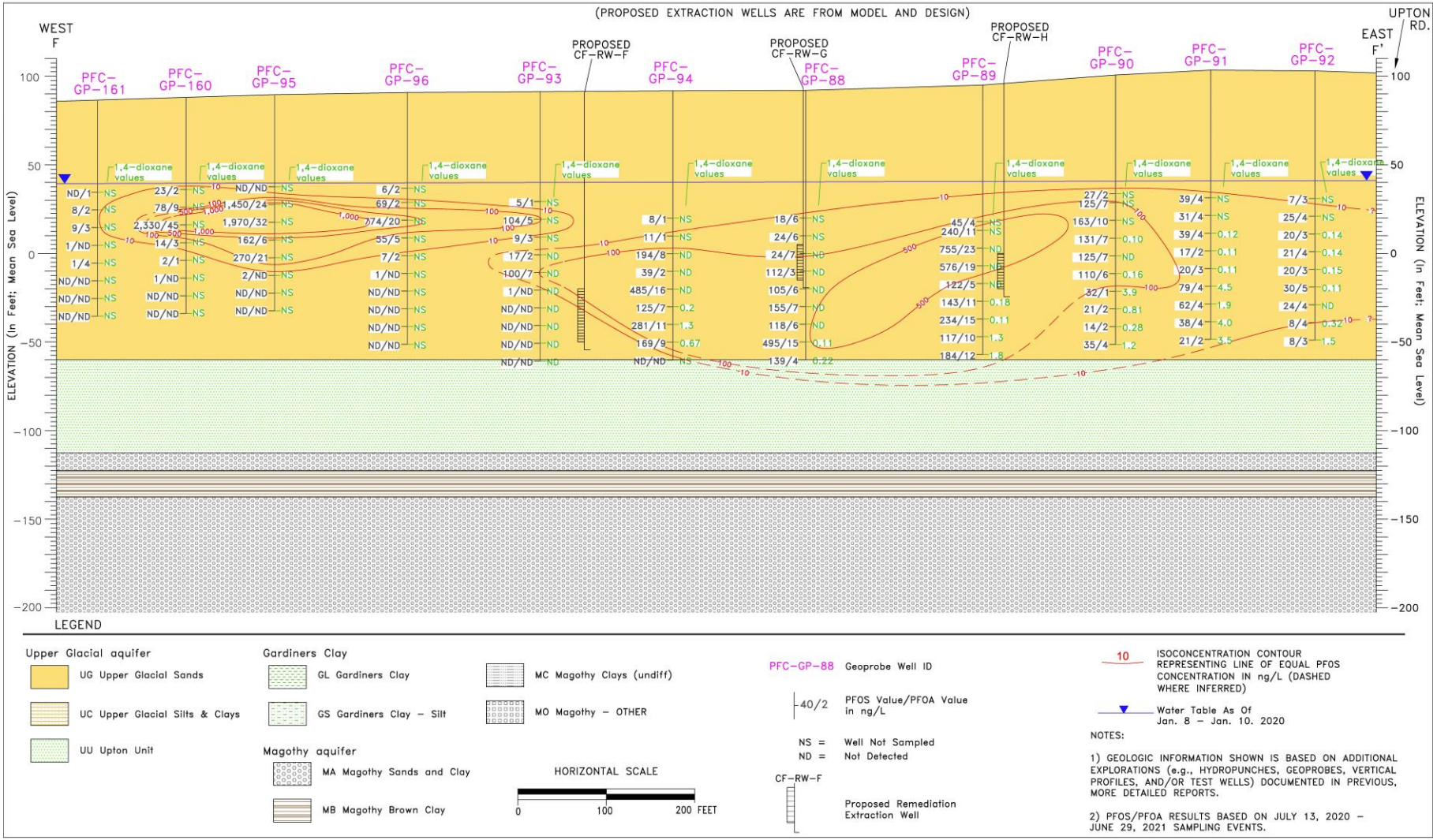
West-East Cross Section Along West Princeton Ave



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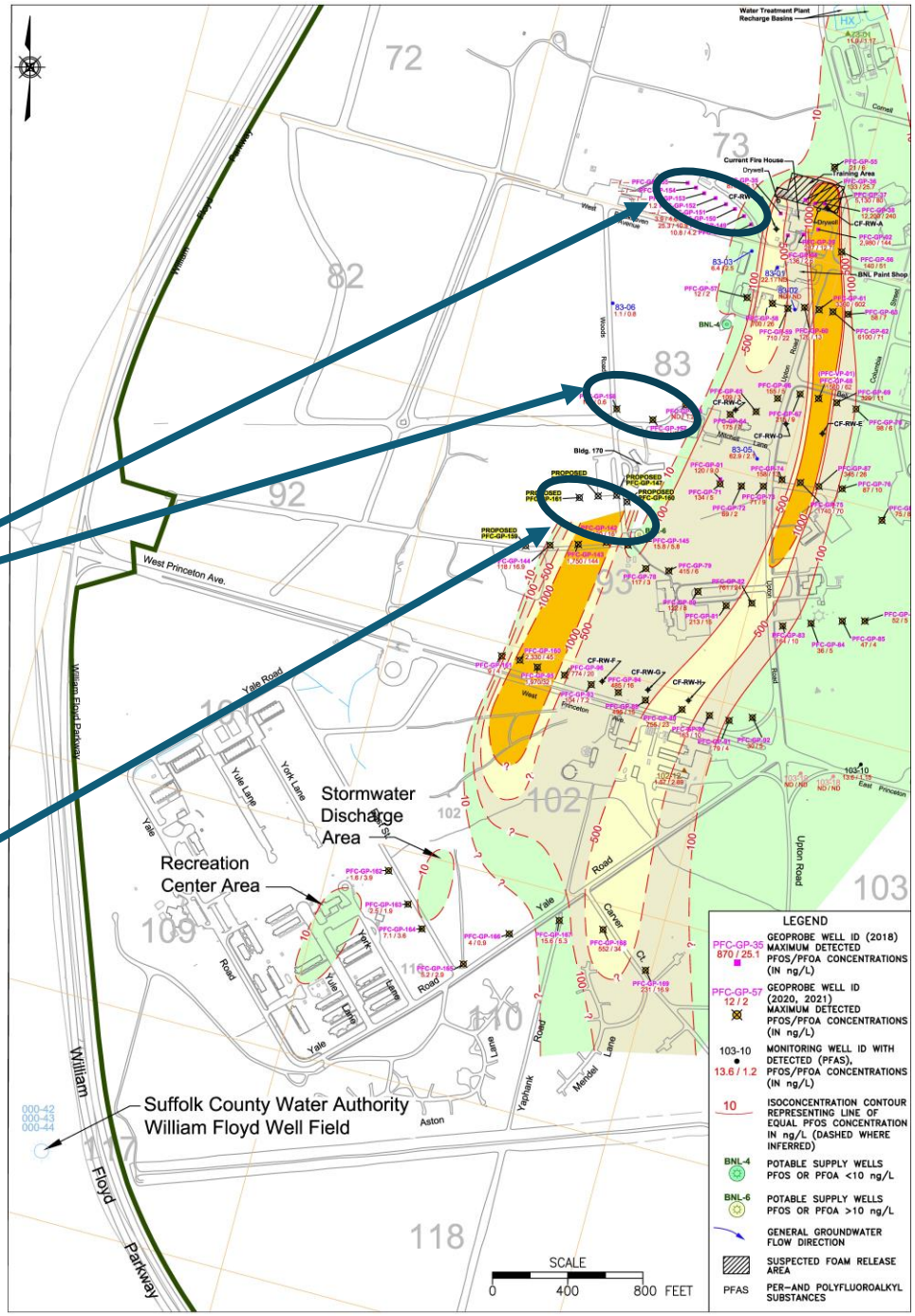
Temporary Wells North of West Princeton Ave.

- Objective is to find the source of the high concentration plume segment
  - Temporary wells installed in two upgradient areas have not identified a source
  - Focus now is on the southern area



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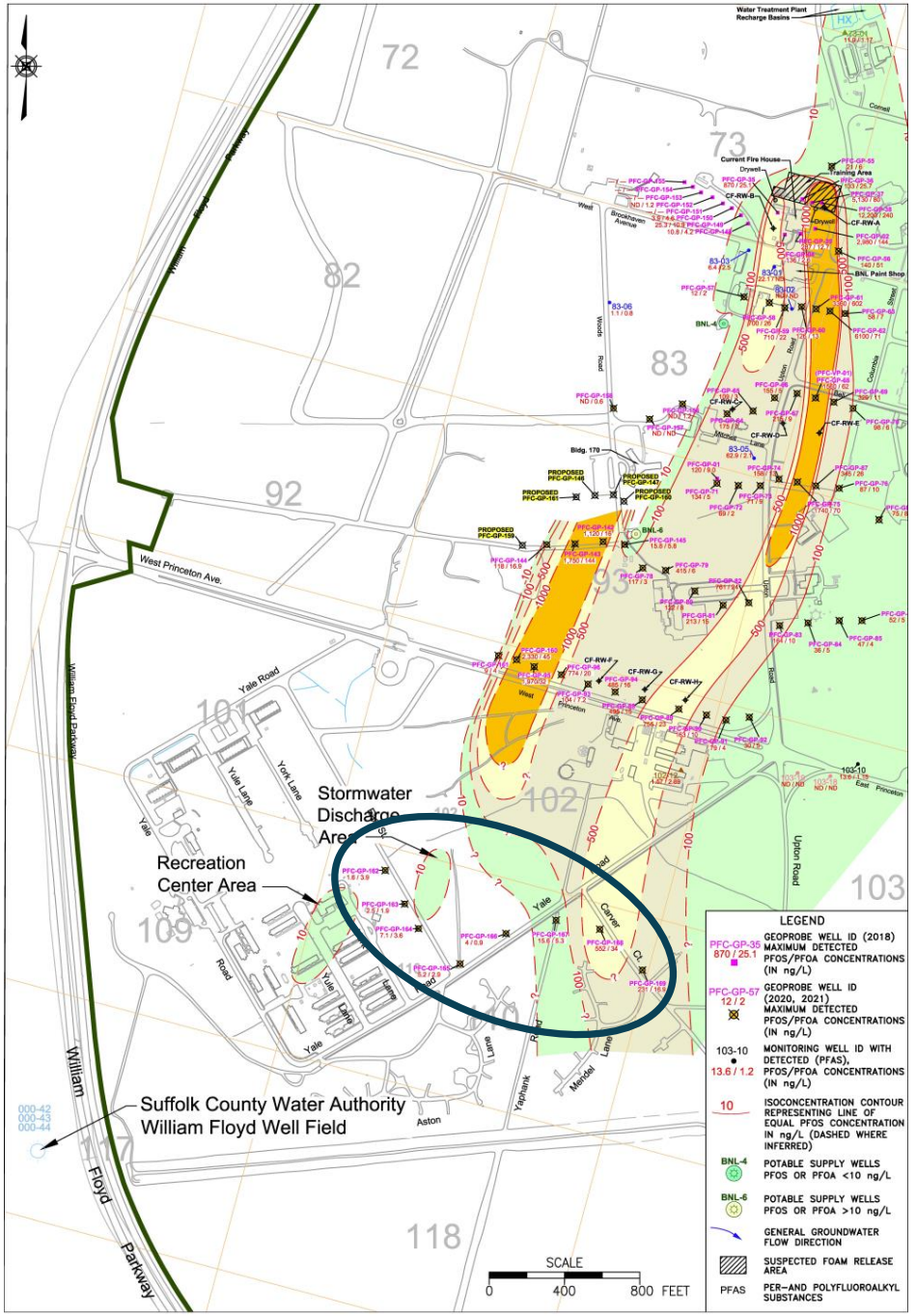
Temporary Wells South of West Princeton Ave.

- Evaluate downgradient migration of the high concentration PFAS plume segment and whether the migration pathway is being influenced by SCWA William Floyd well field
  - Low levels of PFOS have been detected in samples from the William Floyd well field*

    *Data posted on SCWA Website
- Installed eight temporary wells (to ~145 feet deep)



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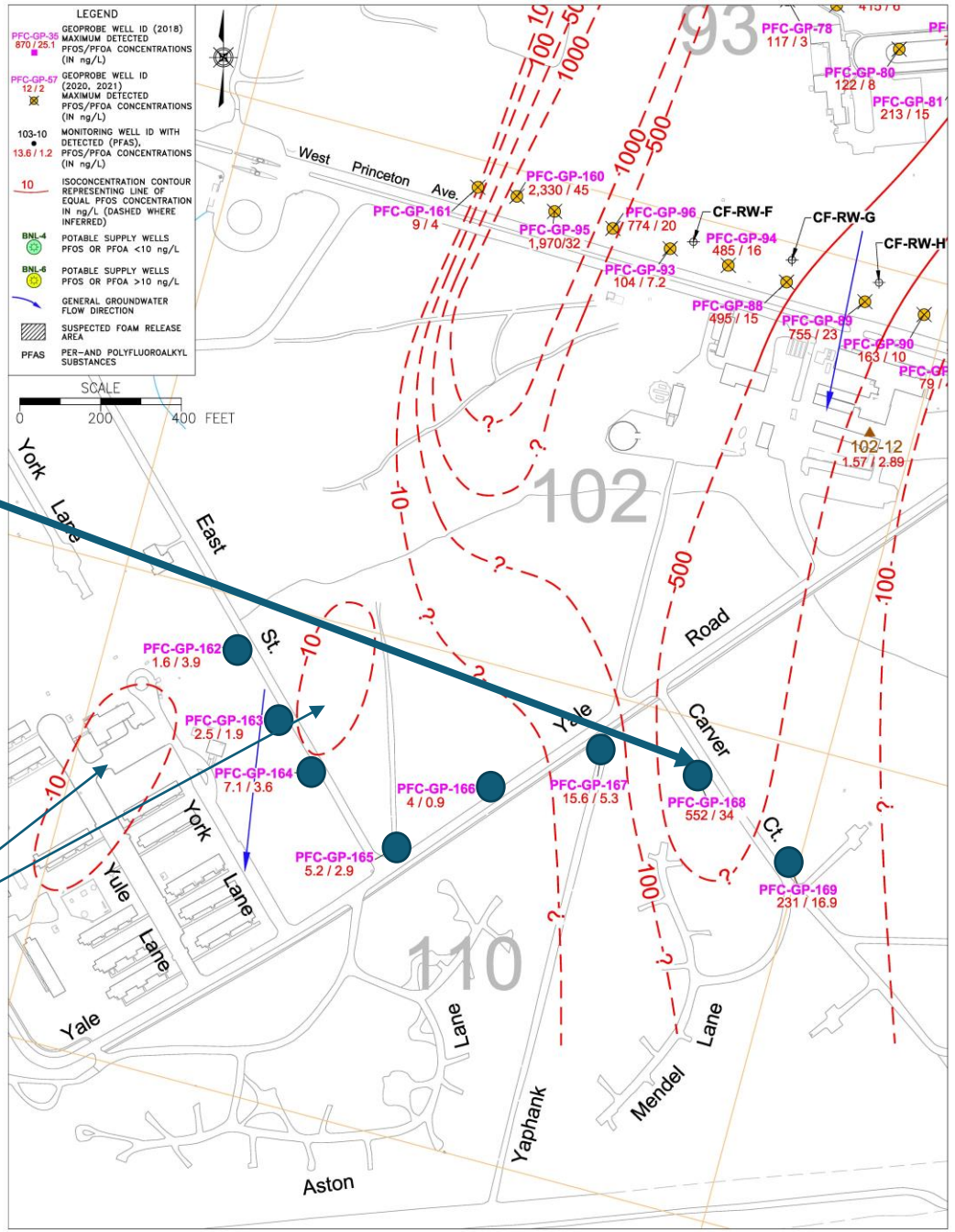
Temporary Wells South of West Princeton Ave.

- **Sample Results**

- PFOS and PFOA detected >10 ng/L in easternmost wells
  - Maximum PFOS and PFOA concentrations of 552 ng/L and 34 ng/L, respectively
- PFOS/PFOA in other wells were <10 ng/L



Contours based upon 2018 data from temporary wells installed near the Recreation Center and stormwater outfall

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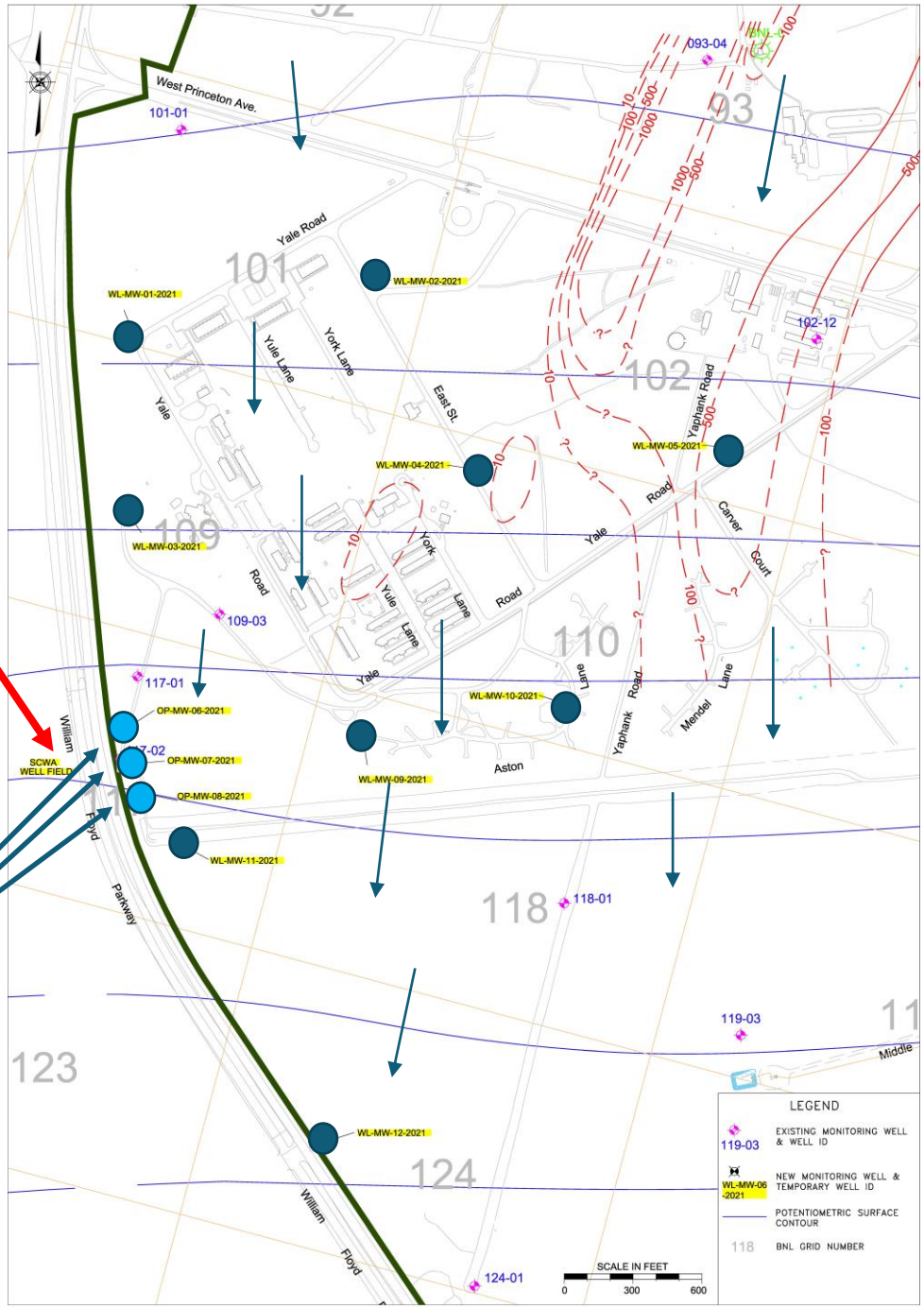
12 New wells SW area of BNL

- Provide additional water level data
  - Help evaluate potential influence the William Floyd well field has on groundwater flow
  - 9 new wells for monitoring water levels
  - 3 new “sentinel” wells east of the William Floyd well field:
    - Water levels
    - Water quality surveillance
      - PFAS were not detected in groundwater samples collected on 10/7/21



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Treatment System Construction

Current Status

- 4 extraction wells and 15 monitoring wells have been installed
- Two new carbon vessels for the current firehouse PFAS plume treatment system were installed
- Started to install piping to connect the extraction wells to the current firehouse treatment system building

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Next Steps

- Continue construction work for the two treatment systems
  - Install remaining extraction wells and monitoring wells
  - Install piping, electric and communications
  - Complete work on the carbon vessels/treatment system buildings
- Most construction work is expected to be completed by Spring 2022

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